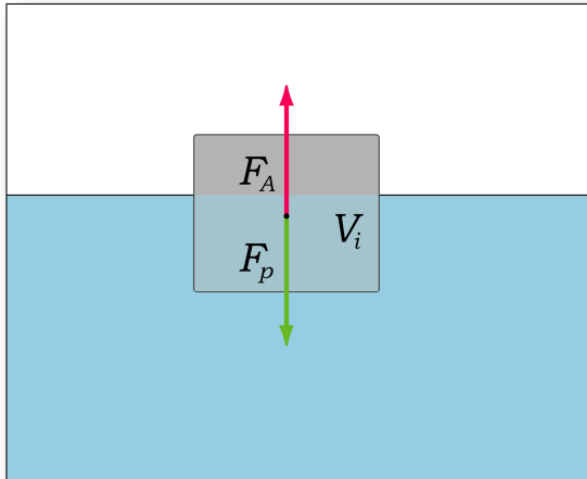


Task:

A piece of metal of density $7.8 \cdot 10^3 \frac{kg}{m^3}$ weight $20 N$ in air. Calculate the apparent weight of the metal when completely immersed in a liquid of $8.3 \cdot 10^{-2} \frac{g}{m^3}$ and $g = 10 \frac{m}{s^2}$

Solution:

$$F_{net} = F_P - F_A = mg - \rho_{liquid}gV = \rho_{body}Vg - \rho_{liquid}gV = Vg(\rho_{body} - \rho_{liquid});$$

$$F_P = mg = \rho_{body}Vg = 20 N$$

$$Vg = \frac{F_P}{\rho_{body}}$$

$$F_{net} = Vg(\rho_{body} - \rho_{liquid}) = \frac{F_P}{\rho_{body}}(\rho_{body} - \rho_{liquid}) = F_P \frac{\rho_{body} - \rho_{liquid}}{\rho_{body}}$$

$$F_{net} = F_P \frac{\rho_{body} - \rho_{liquid}}{\rho_{body}} = 20 N \cdot \frac{7.8 \cdot 10^3 \frac{kg}{m^3} - 8.3 \cdot 10^{-5} \frac{kg}{m^3}}{7.8 \cdot 10^3 \frac{kg}{m^3}} \approx 20 N \cdot 1 = 20 N$$

Answer:

$$F_{net} \approx 20 N$$